



The Canadian Gas Peak Duel: US Exports vs Domestic Demand

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Julian Darley

julian@postcarbon.org

Post Carbon Institute

<http://www.postcarbon.org>

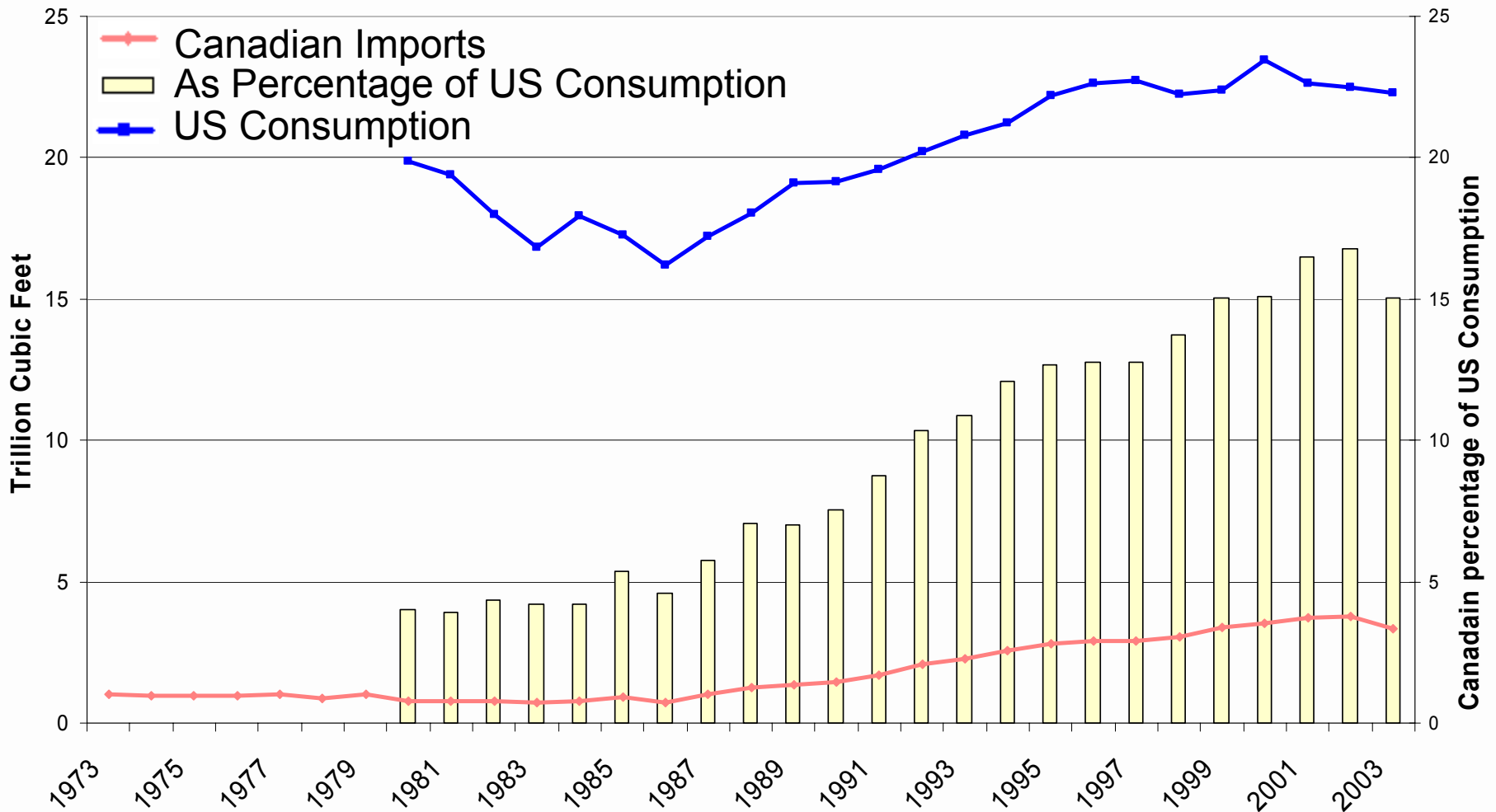


Canadian Gas – Vital for US

- The US is heavily reliant on gas from Canada more than 15% of US consumption
- Canada sends well over half its gas to the US
- Canada plans to increase its own consumption by 40% to 50% through 2025
 - tar sands demand is a large unknown factor
- Evidence suggests that Canadian gas production is in permanent decline – why?
- What might the next few years look like?



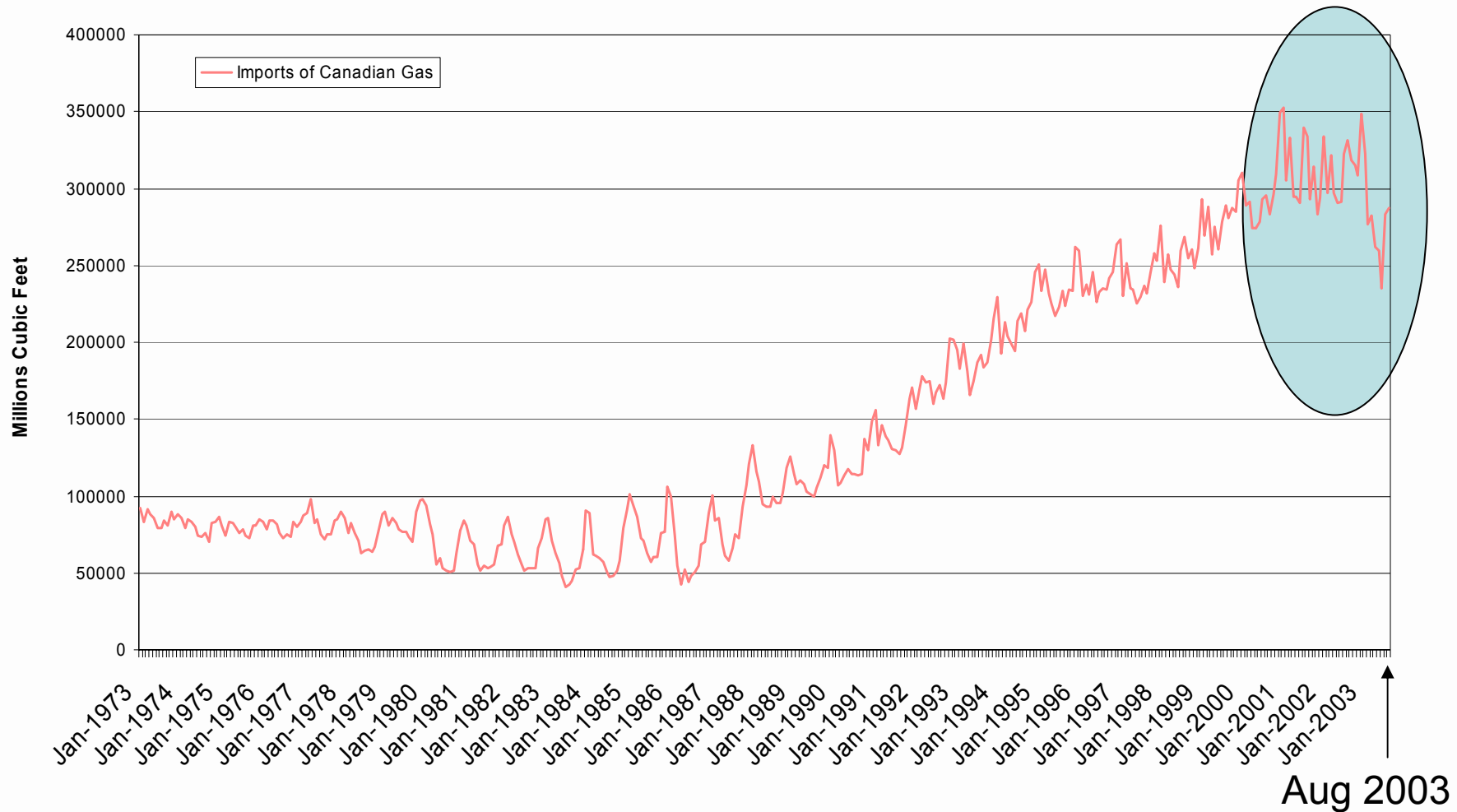
US Gas Imports from Canada vs Consumption & as Percentage





US Gas Imports from Canada

MMcf per month





Canada's Gas Dependence

- Canadian demand ~2.7 Tcf per year
 - 4 Tcf by 2015
- 26% of primary energy
 - planned to rise to 28% - 31% by 2025
- ~80% Canadian homes heat with gas
 - most of Canada is v. cold in winter!
 - political matter (cf US Mid West...)
- Power generation gas-fired ~6%
 - Planned to increase to 16% by 2025
 - in 'Supply Push' scenario = Business As Usual (BAU)
 - Gas is preferred for new generation either way (BAU or BAU-lite)
 - Especially if Canada were to take GHG reduction seriously
 - Kyoto officially dead?
 - Prime Minister Paul Martin – indecisive on Kyoto
 - Canadian business almost universally against limiting GHGs



Tar sands

- Tar sands are vital to North American oil supply
 - but are a complicating factor for gas
- Each barrel of synthetic crude oil requires ~1 Mcf gas to produce
- Year 2000 production ~600,000 b/d
- Planned increase ~2.4 – 3 Mb/d by 2025
 - very optimistic forecast
- Expected to consume > 1 Bcf/d by 2010

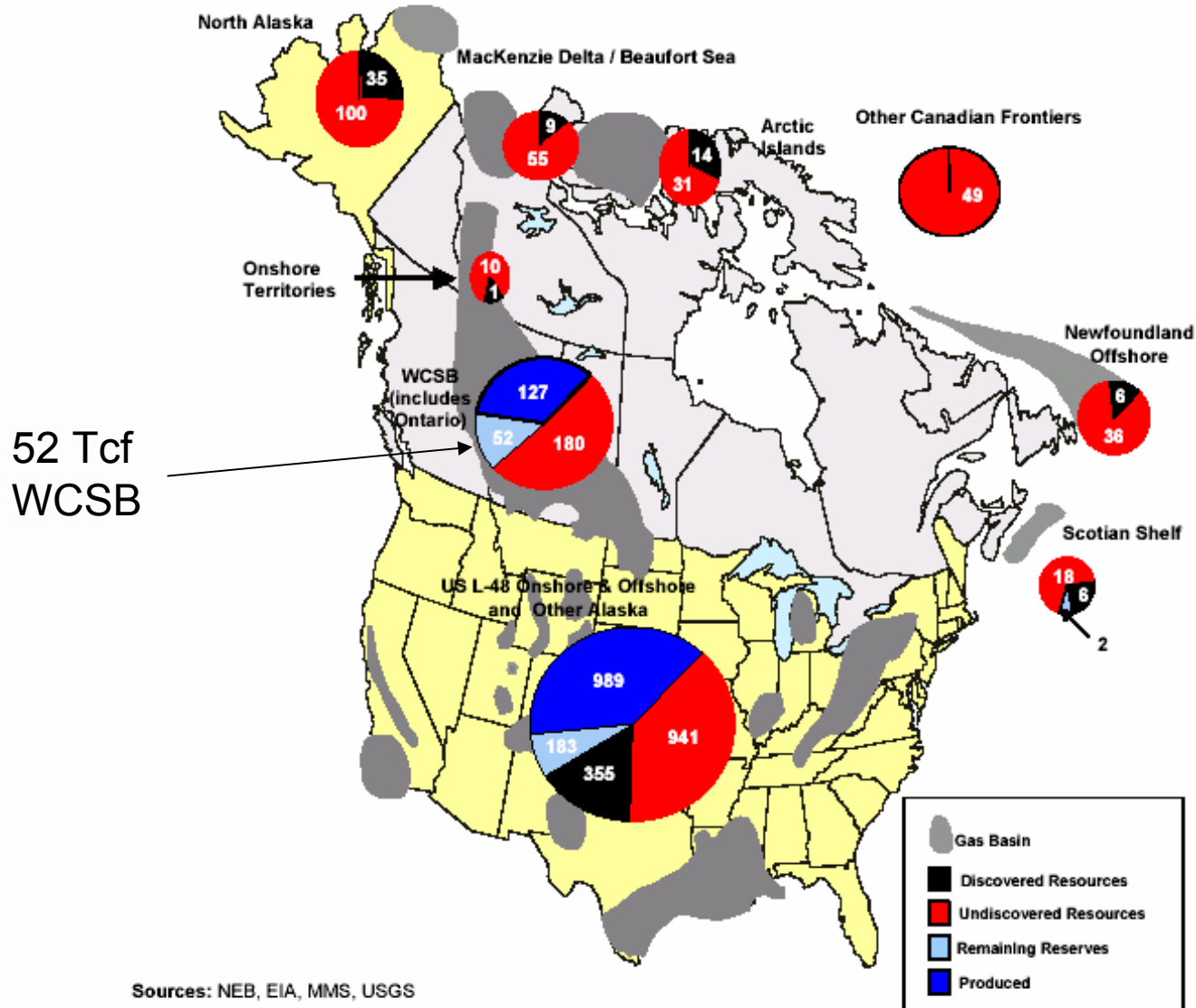


Canada's Gas Production

- At present almost all Canadian gas comes from WCSB (Western Canadian Sedimentary Basin)
 - over 90%
- New gas plays are either a small percentage or experimental
- 2001: Canadian Gas Potential Committee revised (all) reserves sharply downward
 - Canada ~60Tcf

Gas Reserves

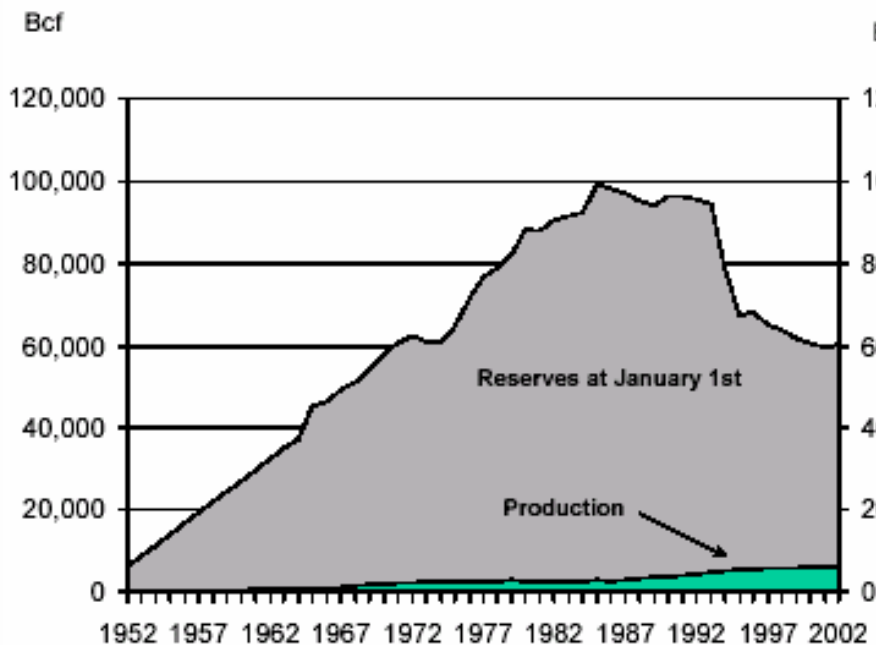
Canadian & US Natural Gas Resources and Reserves (Tcf)



Reserve Trends

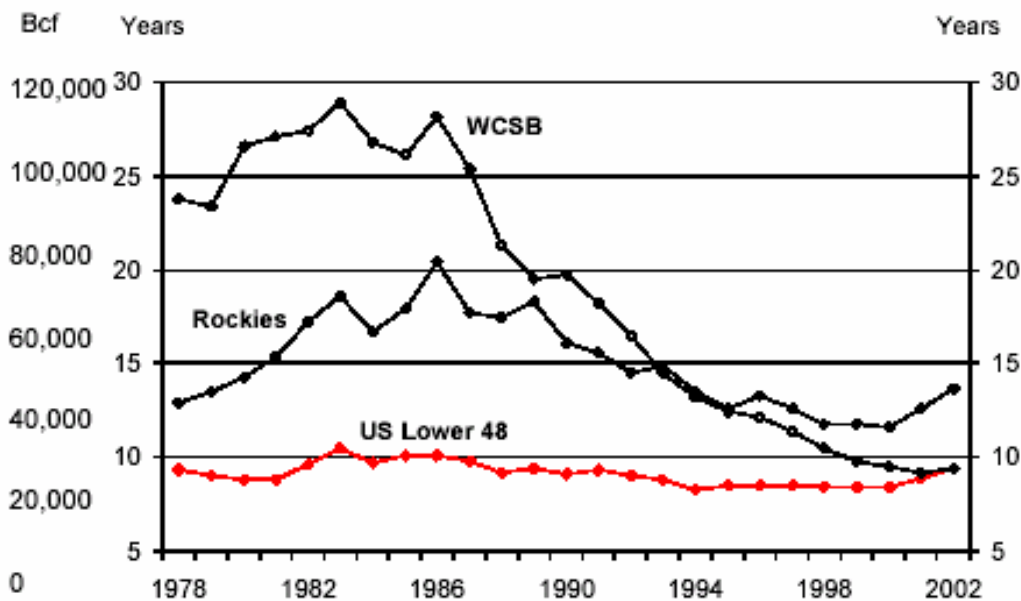
- “Reserve trends are a powerful indicator of future production.”

Total Canadian Gas Reserves



Source: CAPP

Reserves to Production Ratios



Sources: EIA, CAPP

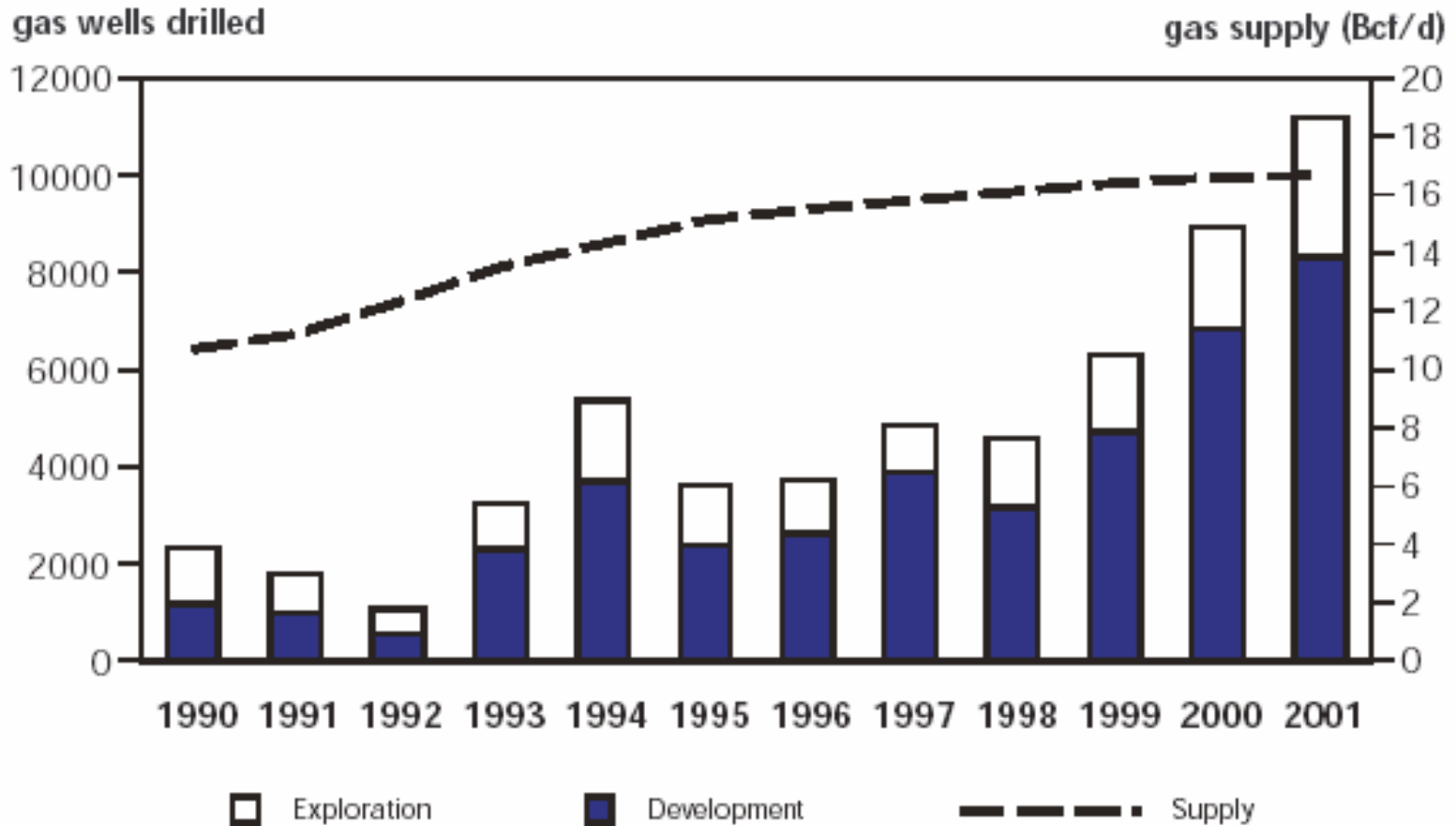


WCSB

- Western Canadian Sedimentary Basin
 - production is now falling
 - despite very high levels of drilling
- 1996: 4,800 wells drilled, prodn ~15.5 Bcf/d
- 2001: 12,400 wells, production 16.8 Bcf/d
- 2003: 11,200 wells - 15.5 Bcf/d

WCSB: Production vs Drilling

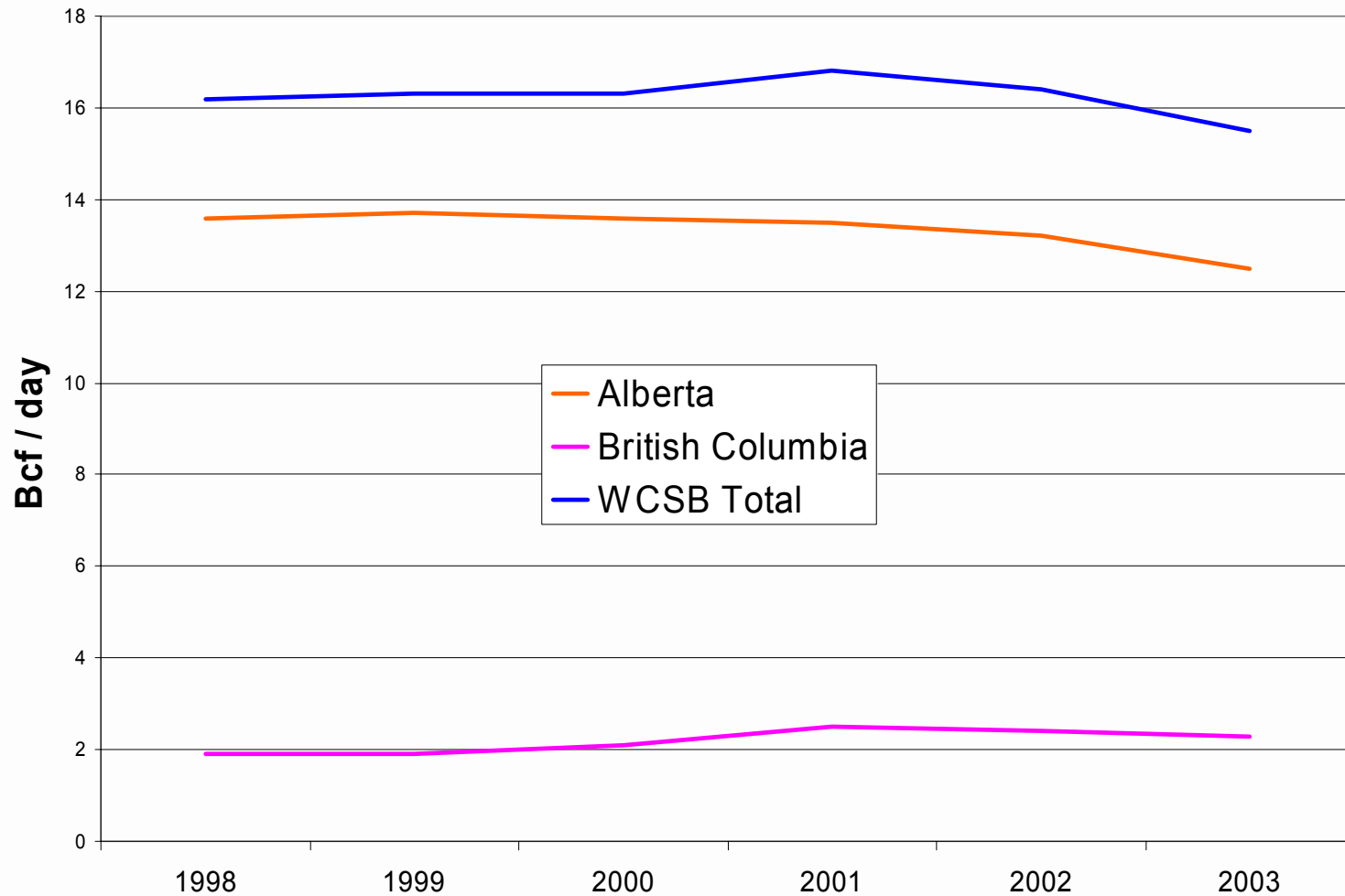
WCSB Gas Supply Response



Sources: Nickles Daily Oil Bulletin and Geoscout for Windows



WCSB – now past peak

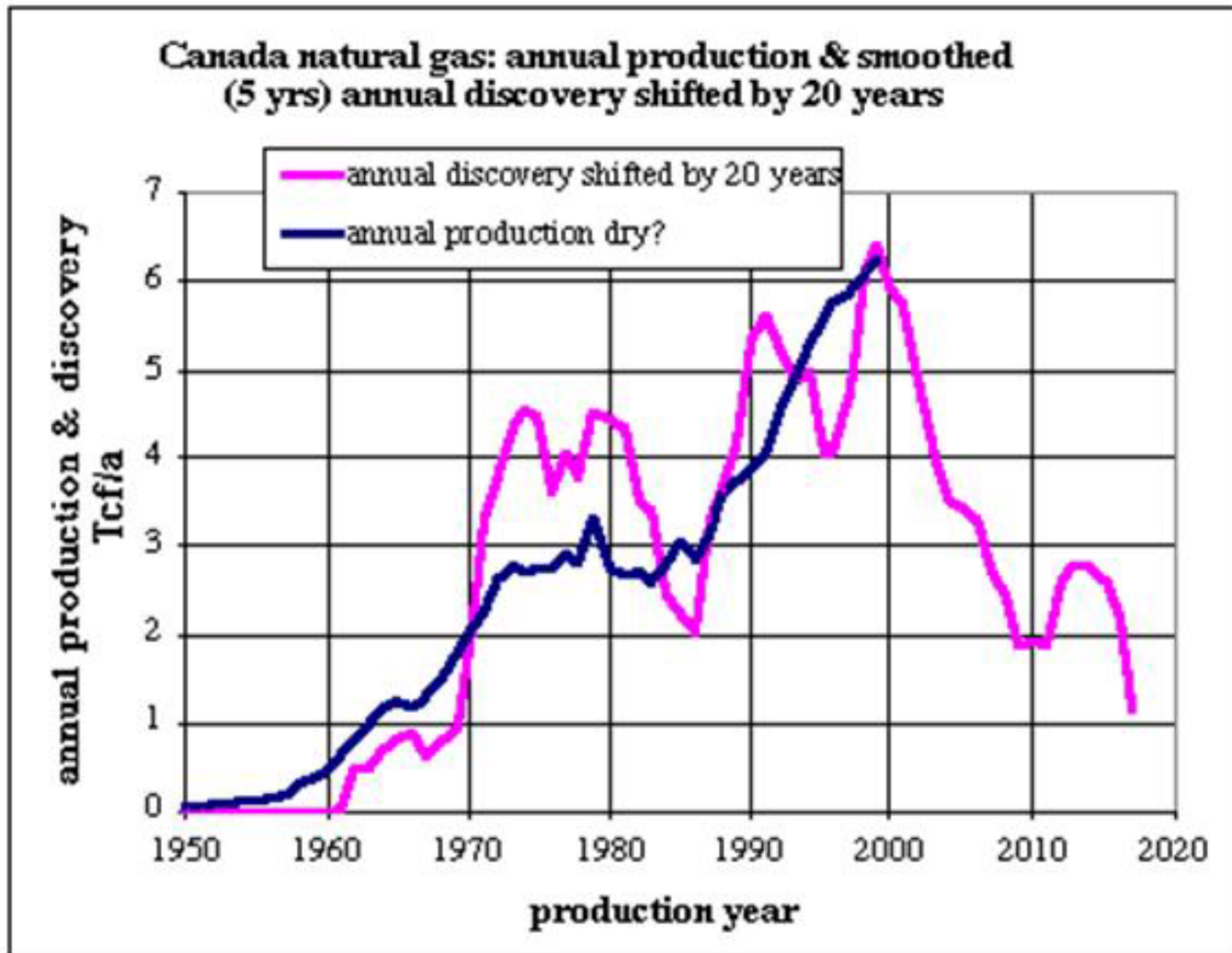




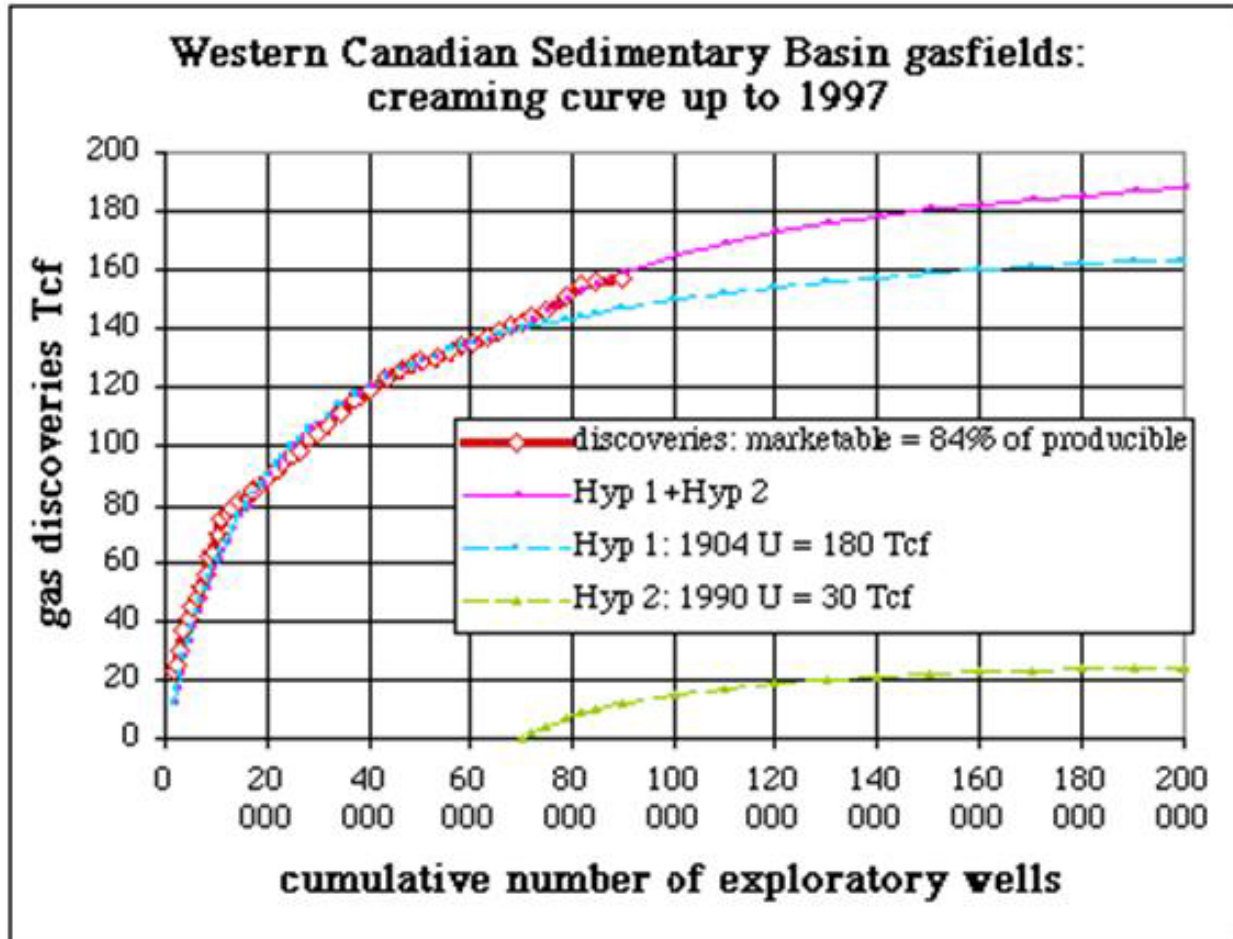
WCSB – Alberta leads decline

- British Columbia, 15% of WCSB, maintained production ~2.3 Bcf/d
 - mainly by Ladyfern – gone in 2004
- Production from Alberta is falling
 - Peaked in 1999 at 13.7 Bcf/d
 - September 2003 fallen to 12.5 Bcf/d
 - “In 2002, natural gas production in Alberta alone decreased by 3.8%, to 4.8 Tcf” EIA from NEB
 - “According to Alberta Energy and Utilities Board (EUB), production is expected to increase in Alberta in 2004 but then will decrease by 2% per year until 2012.” EIA
 - Sept 1, 2003: 938 wells to be ‘shut-in’ to reduce pressure loss in production of ‘more valuable’ tar sands
 - 330 wells now off-line ~94 MMcf / day (~0.75%)
 - 608 more wells in dispute – decision April 2004
 - Will hold back total of ~2% of Albertan gas

Canada natural gas discovery + production

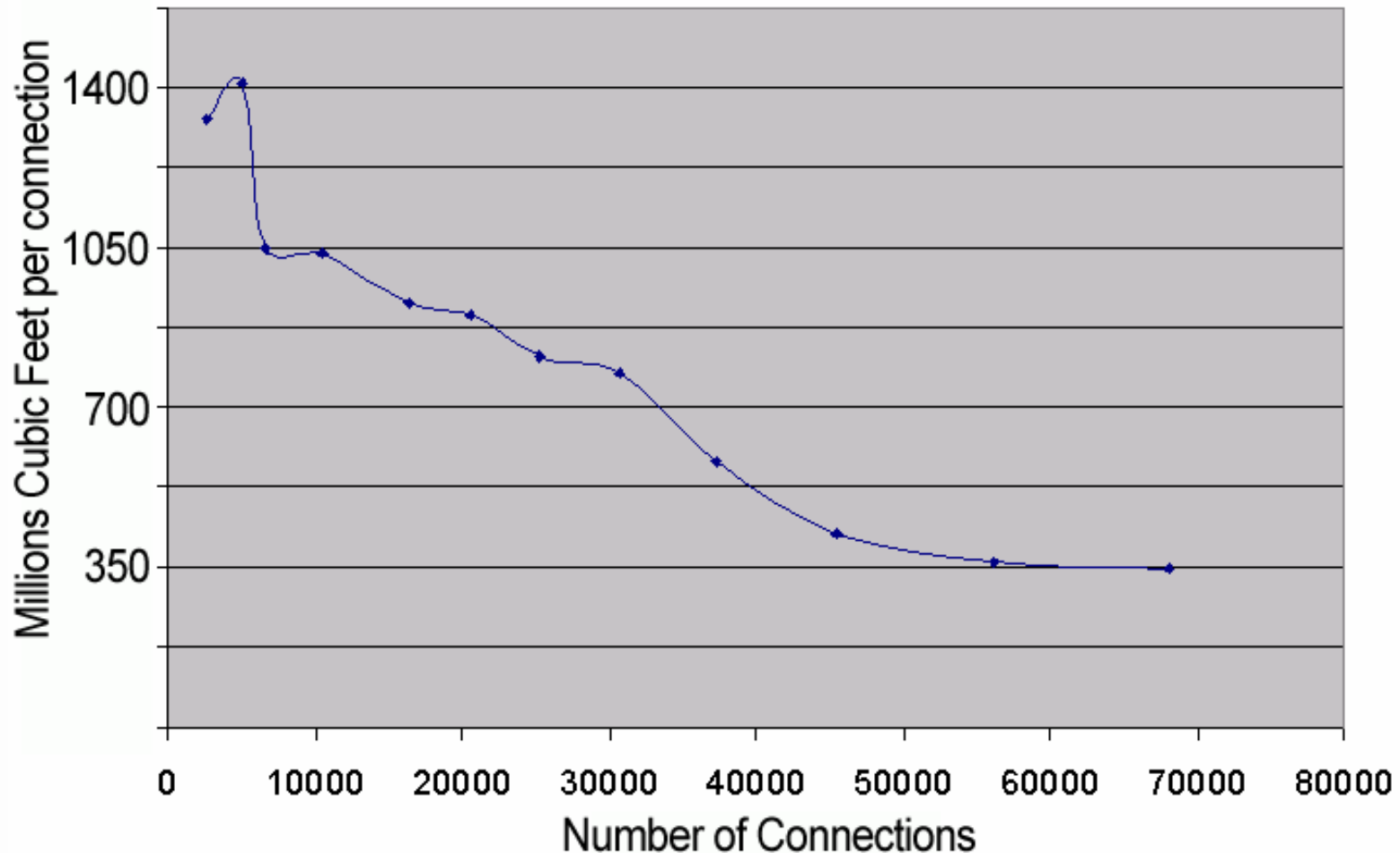


WCSB Creaming curve



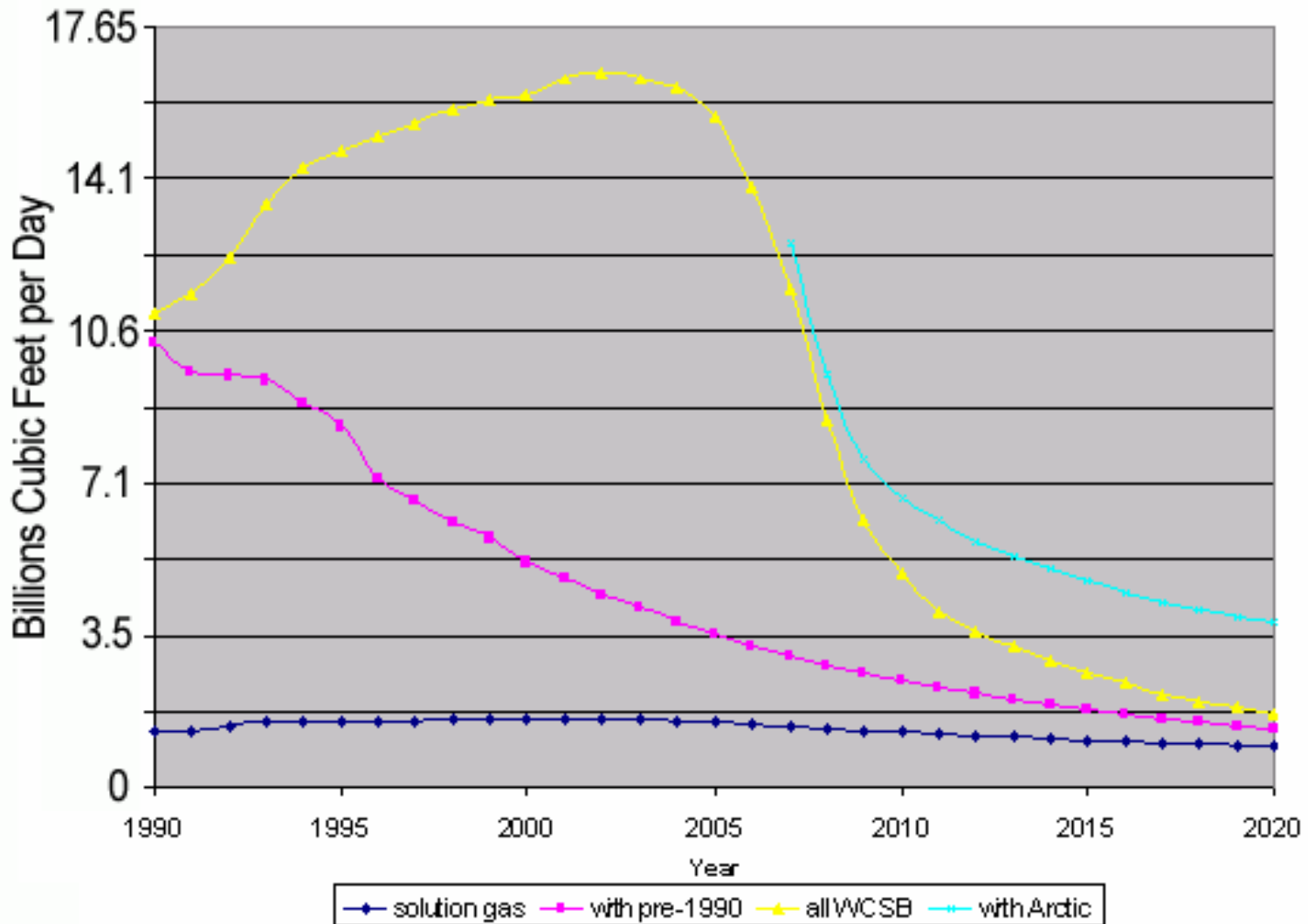
WCSB – Total Gas produced per connection

Total gas extracted over the life of an average connection - from 1990 onwards





An independent WCSB Forecast



Based on NRCAN Outlook November 2003



New Canadian Gas

- Atlantic Coast
 - Sable Island: difficult to maintain production ~500 MMcf/d
 - Deep Panuke: not online yet – delays, but promising
- British Columbia
 - Actually not really new - northwestern end of WCSB (~15%)
 - Ladyfern – over-produced, gone by end of 2004
- Mackenzie Delta
 - maybe online before 2010 – 800 MMcf-1.2Bcf
 - probably all needed for tar sands production
- Coalbed Methane
 - still in experimental phase
 - Albertan coal tends not to be ideal for CBM



Gas decline is political

- As Canadian gas production continues to decline there will be major political issues:
- NAFTA Chapter 6 'Proportional Sharing' agreement
 - Canada exports ~60% gas south
 - Commits Canada to sharing same percentage even as production declines
- Alberta Gas Resources Preservation Act
 - “requires Alberta to set aside large volumes of natural gas for the province's use before exports are permitted. Companies seeking to export natural gas from Alberta are required to seek the approval of EUB. Exports of natural gas are not permitted unless there is a surplus and they do not jeopardize the needs of Alberta's core consumers for the next 15 years.”
- Prime Minister Paul Martin wants better relations with US
 - but he also needs to be elected by Canadian voters



Outlook for Canadian Gas

- WCSB is mature
 - Now only 10% of drilling is exploration
 - Majors are looking elsewhere
 - mainly in other continents
- July 2003: National Energy Board report
 - ‘Canada's Energy Future: Scenarios for Supply and Demand to 2025’
 - “How Canada’s energy future environment unfolds is **uncertain** and **highly unpredictable**.”
 - “a major **uncertainty** is the availability of supplies of natural gas”



Outlook for Canadian Gas Exports

- If trends continue, Canada faces the very real possibility of not having enough gas for its own needs within a decade or less
- Canada cannot maintain exports to US at current levels
 - 2004: decline is likely
 - But EIA (Oct 2003) predicts 4.5 Tcf total imports for 2004
 - 2005: unpredictable & uncertain
 - Barring miracles, certain export decline (possibly very steep) will occur well before 2010
 - worst case: if Canadian production cut in half
 - will exports stop or will NAFTA win/work?
- Conclusion: We certainly live in 'interesting times'...



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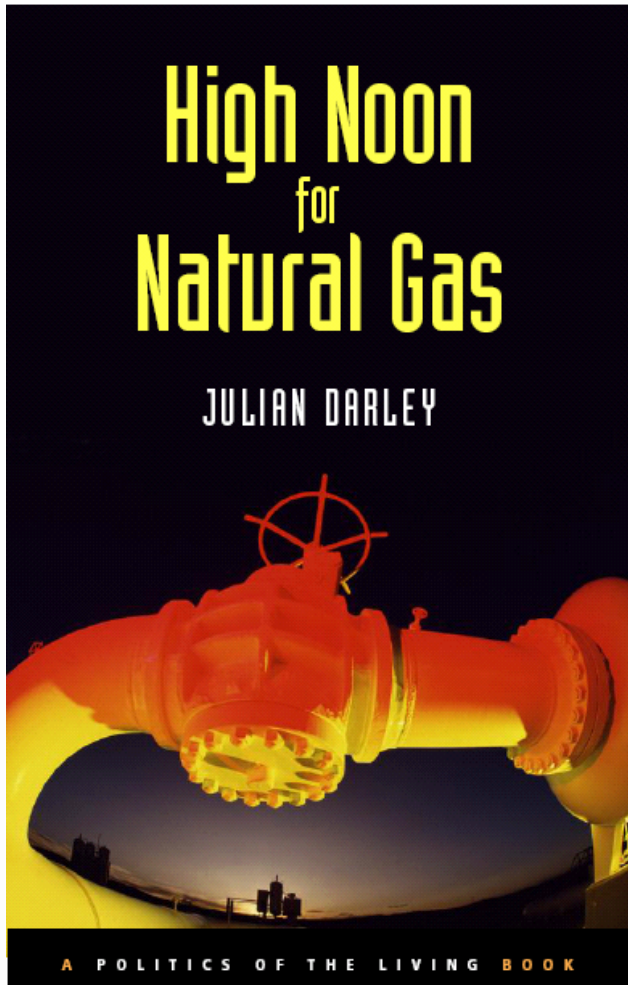
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